

Notes: Metamorphic Rocks

Definition - meta = change, morph = form
- changes in composition or texture → new rock

I. Factors of Metamorphism

a) Temperature

- up to $\sim 200^{\circ}\text{C}$ are sedimentary diagenesis processes
- upper limit is melting → igneous rocks
- result in larger crystals

b) Pressure

- confining pressure - equal P in all directions from surrounding rocks
→ deformation and denser minerals
- directed stress - not equal, caused by mountain building / squeezing
→ foliation and compositional banding

c) Chemistry

- fluids flow through the rock resulting in a changed rock composition.

II. Types of Metamorphic Rocks

- can be subdivided by texture:
 - foliated (peely-aparty look where mica flakes lined up from P)
 - non-foliated (re-crystallized from heat)

Foliated (pressure)			parent rock
Increasing Pressure ↓	meta Rock		
	slate	Pressure lines up mica flakes	shale (sed.)
	Phyllite	" "	slate (meta)
	Schist	" "	Phyllite (meta)
	Gneiss	Pressure + heat → compositional banding	Schist (meta) or granite (ig) or conglomerate (sed)

Non-Foliated (heat + maybe P)			parent rock
	Quartzite	Heat → increases crystal size	sandstone (sed)
	Marble	" " / recrystallize	limestone (sed)
	Metaconglomerate (stretched pebble conglomerate)	pressure stretches the pebbles	Conglomerate (sed)

III. Metamorphic Environments

- regional metamorphism
 - mountain building events
 - creates foliated rocks
- contact metamorphism
 - near a pluton, heat metamorphoses the country rock.
 - closer to pluton → more heat → more metamorphism.
- Fault-zone metamorphism
 - temp. and P increase along fault line

c) fault-zone metamorphism

- temp. and P increase along fault line

IV. Metamorphic Grade

- a description of overall intensity of metamorphic-ness.

- high grade meta. rocks show more changes, were subject to higher Ts and Ps.

